Regular Articles

Preventive Mental Health and Substance Abuse Programs and Services in Managed Care

Sharon L. Dorfman, ScM, CHES
Shelagh A. Smith, MPH, CHES

Abstract

If effective preventive behavioral health services were available to the millions of Americans enrolled in managed care organizations, the public health impact could be significant. This project sought to summarize published research-based information about effective preventive interventions for mental health and substance use (tobacco, alcohol, and other drugs) shown or likely to have no negative cost impact. Fifty-four studies satisfied seven screening criteria. Their findings demonstrated that preventive behavioral health interventions appropriate for managed care settings have been evaluated and have been shown to be effective. Some produced cost savings or offset costs. Six preventive behavioral health interventions are therefore recommended for managed care.

Introduction

The human toll and resource costs of mental health disorders and substance abuse problems to individuals and society are widespread, devastating, and profoundly under-recognized. According to *The Global Burden of Disease*,[1] major depression imposed the fourth greatest disease burden worldwide in 1990, as measured in disability-adjusted life years. The study projected that by the year 2020, depression would be ranked second behind heart disease.

In addition, the same study found that 5 of the 10 leading causes of disability worldwide in 1990, measured in years lived with a disability (YLD), were mental health and substance abuse problems: unipolar depression, alcohol use, bipolar affective disorder (manic depression), schizophrenia, and obsessive-compulsive disorder. Combined, these conditions accounted for 21.8% of YLD. Tobacco, alcohol, and illicit drugs ranked fourth, fifth, and ninth on a list of selected risk factors contributing to the total global burden of disease and injury.[1]

In terms of preventable causes of mortality in the United States, an analysis of "actual" causes of death concluded that tobacco was first (400,000, or 19% of deaths), alcohol was third (100,000,

Address correspondence to Shelagh A. Smith, MPH, CHES, Senior Public Health Advisor, Organization & Financing Office, Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, 5600 Fishers Lane, Room 15-87, Rockville, MD 20857, e-mail: ssmith@samhsa.gov.

Sharon L. Dorfman, ScM, CHES is President, SPECTRA, Ponce Inlet, Florida.

Journal of Behavioral Health Services & Research, 2002, 29(3), 233–258.

or 5% of deaths), and illicit drug use was ninth (20,000 deaths) in 1990. The authors pointed out that health resources were being allocated based on conditions recorded on death certificates rather than on these preventable, lifestyle-related causes of death, estimating the national investment in prevention at less than 5% of total annual health care expenditures.[2]

The importance of maintaining mental health and avoiding substance abuse to the health of the public is further reflected in the US Department of Health and Human Services' Healthy People 2010 objectives for the nation.[3] Tobacco use, substance abuse, and mental health are listed among the 10 leading health indicators. In addition, the document contains separate sections for mental health and mental disorders, substance abuse, and tobacco use. The section on disability and secondary conditions also addresses mental health and substance abuse.

Because they provide health coverage for the vast majority of publicly and privately insured Americans, managed care organizations have a vital role to play in promoting mental health and preventing substance abuse. According to the 1999 Mercer/Foster Higgins national survey of employer-sponsored health plans,[4] 89% of privately insured Americans were enrolled in managed care plans in 1998. Of the 31,940,188 Americans enrolled in Medicaid in 1999, nearly 56% were enrolled in managed care organizations.[5] As of November 2000, close to 16% of almost 39 million Medicare beneficiaries had chosen the managed care option, known as a Medicare + Choice organization.[6] The availability of effective preventive interventions for substance abuse and mental health to this large population of managed care organization enrollees could have a significant public health impact.

The cost of diagnosing and treating mental health and substance abuse problems in the United States was estimated to be $82.2 billion in 1997. Of this total, 86% ($70.8 billion) was for mental illness, and 14% ($11.4 billion) was for alcohol and drug abuse.[7] In addition to the medical costs, the burden of mental disorders and substance abuse includes the pain and suffering experienced by individuals and their families, loss of productivity at home and at work, and the stigma still pervasive within society. It has been estimated that in the course of a year, 28% of adults in the United States will suffer from a mental health disorder or substance abuse.[8]

With this magnitude of impact on public health, medical care, and quality of life, the potential of prevention to reduce the toll of mental health and substance abuse problems is considerable. In its overview of prevention, the 1999 report[9] of the Surgeon General on mental health noted that successful prevention programs have been documented through rigorous scientific trials. Also, in a 1999 monograph,[10] the Substance Abuse and Mental Health Services Administration (SAMHSA) concluded that prevention programs have been shown to increase the latency of first alcohol, tobacco, or drug use; to reduce alcohol, tobacco, or drug use; and to decrease risk factors related to later alcohol, tobacco, and drug use.

The challenge of delineating and describing the knowledge base for preventing mental health and substance abuse problems is complicated by the use of multiple definitions of prevention. In public health, the classic categories of primary, secondary, and tertiary prevention have gained wide acceptance in the decades since their popularization by the Commission on Chronic Illness.[11] In recent years, however, a narrower definition of prevention has emerged in the field of mental health, based on a classification proposed in the early 1980s[12] and embraced in the 1994 report of the Institute of Medicine (IOM), *Reducing Risks for Mental Disorders: Frontiers for Prevention Intervention Research*.[13] The IOM model of prevention presents a continuum of health care that includes prevention, treatment, and maintenance. In the IOM model of prevention, there are three classifications of interventions:

1. Universal interventions, recommended for the entire population because their benefits outweigh their costs and associated risks
2. Selective interventions, recommended only for groups at increased risk because their moderate cost is justified by the increased chance that illness will occur

3. Indicated interventions, recommended only for high-risk individuals and persons experiencing early symptoms of a disorder, for the purpose of preventing further development of a problem or to reduce its duration or severity

Excluded from this model are mental health promotion,[14] which falls within the public health definition of primary prevention, and post-diagnostic interventions,[13] which are encompassed within the public health categories of secondary and tertiary prevention.

In 1998, the Workgroup on Mental Disorders Prevention Research of the National Advisory Mental Health Council (NAMHC)[15] recommended the adoption of an expanded definition of prevention research. The NAMHC workgroup included a pre-intervention prevention category at one end of the mental health intervention spectrum and added comorbidity prevention, disability prevention, and relapse prevention to the IOM categories of universal, selective, and indicated prevention.

Although the potential of disease prevention and health promotion interventions to improve the health of managed care organization enrollees while saving or offsetting medical care costs has been recognized for many years,[16] there is evidence of a trend among managed care organizations toward decreasing benefits and increasing restrictions for mental health and substance abuse.[13] A recent study[17] found that at least 75% of employer-sponsored health plans placed greater restrictions on behavioral health coverage than on general medical coverage.

Health care purchasers and individuals who design benefits are primary decision makers about coverage options for preventive behavioral health programs and services offered by managed care organizations (MCOs). While there is evidence of the effectiveness of many preventive interventions, improved quality of life for consumers, and financial incentives for providers, inquiries from and conversations with managed care decision makers suggest a number of counterbalancing barriers, including the following:

- Doubts about whether preventive behavioral interventions really work
- Concerns about the economic impact of coverage for preventive behavioral health services in the face of cost containment pressures
- Lack of knowledge and awareness of behavioral health interventions among managed care decision makers
- Limited training, skills, and confidence of health care providers with respect to behavioral health interventions
- A trend toward having behavioral health care services carved out from other health care services to be delivered separately by managed behavioral health care organizations
- Insufficient preventive behavioral health information tailored to the needs of MCOs
- Gaps in preventive behavioral health intervention and cost-effectiveness research
- Few credible sources of consensus recommendations on preventive behavioral health interventions

Responding to the need for identification and dissemination of the evidence supporting behavior change services in managed health care is a series of studies undertaken in 1999 by the Center for the Advancement of Health, with funding from the Robert Wood Johnson Foundation.[18] One component of this initiative was an evaluation of the readiness of the scientific evidence on behavior change interventions to be implemented in clinical settings. The project included a literature search and the development of descriptive evidence tables. The topics of alcohol and other drug misuse as well as smoking cessation were addressed in the risk reduction/preventive health behaviors category; depression was included in the risk management/chronic diseases category.

SAMHSA is responsible for (1) disseminating knowledge regarding model preventive programs for mental health and substance abuse and their outcomes and (2) publicizing the results of state-of-the-art research and evaluation. Within SAMHSA, the Offices of Managed Care in the Center

for Mental Health Services (CMHS) and the Center for Substance Abuse Prevention (CSAP) are working to increase the availability of preventive mental health and substance abuse programs and services to the increasing number of Americans who depend on managed care organizations to meet their health care needs.

This project was undertaken with funding from CMHS and CSAP to answer two primary questions: (1) Is there a body of research that supports the provision of preventive services in mental health and substance abuse (tobacco, alcohol, and other drugs)? and (2) Is there evidence from these evaluations that provision of such services will not increase overall costs? This article reviews evidence of the effectiveness of preventive behavioral health interventions and identifies programs and services supported by published research findings. MCO decision makers and other stakeholders can use this research-based information when considering coverage for preventive behavioral health in MCO contracts.

Methods

To establish and document evidence of effective interventions to prevent substance abuse and mental health problems, a search was undertaken for peer-reviewed, published articles about mental health and substance abuse preventive interventions. This search was conducted primarily through Internet Grateful Med V2.3.2 and its 11 databases (MEDLINE, HealthSTAR, PREMEDLINE, AIDSLINE, AIDSDRUGS, AIDSTRIALS, DIRLINE, HISTLINE, HSRPROJ, OLDMEDLINE, and SDILINE). To locate appropriate articles, combinations of the following terms were used in database searches: behavior, cost-benefit analysis, cost-effectiveness, cost savings, evaluation studies, health education, health maintenance organizations, health promotion, intervention studies, managed care programs, mental health, patient education, prevention, preventive health services, preventive medicine, primary prevention/economics, and substance abuse.

In addition, published studies were sought through SAMHSA's National Clearinghouse for Alcohol and Drug Information (NCADI), the CMHS National Mental Health Services Knowledge Exchange Network (KEN), and the Web site of the Agency for Healthcare Research and Quality (AHRQ; formerly the Agency for Health Care Policy and Research [AHCPR]). Articles also were drawn from the authors' files and from staff in the CMHS and CSAP Offices of Managed Care. Finally, researchers who made relevant conference presentations were contacted by telephone or electronic mail to solicit any published articles based on their work.

Multiple search methods using the 11 databases and 16 key words/phrases cited earlier yielded over 800 citations and abstracts. They were scanned to identify articles with the potential to meet the following seven criteria for inclusion in this study:

1. At least one intervention to prevent substance abuse and/or mental health problems was evaluated, or multiple interventions were included in a review of the literature or a meta-analysis
2. The purpose of the intervention was consistent with the Commission on Chronic Illness'[11] definition of primary or secondary prevention or the IOM's[13] definition of universal, selective, or indicated prevention
3. The study population was human subjects
4. The intervention was delivered in a managed care organization, in another health care setting, or in a community-based setting to which a health care provider could make referrals
5. Data supported the effectiveness of the intervention as defined by the author(s)
6. Data demonstrated that the intervention resulted in cost savings, cost offset or no negative impact on cost, or had the potential to do so
7. The article was published in English between 1964 and 1999

Although the majority of citations clearly did not meet one or more of the seven criteria, 285 documents were obtained for further examination, based on their potential appropriateness. After detailed analysis, only 54 articles ultimately met all seven criteria.

The following information was extracted from each of the final 54 articles, although some items were missing or incomplete:

- Developmental stage(s) of research subjects (prenatal/pregnancy, infants under age 1, children age 1 to 12, adolescents age 13 to 17, families, adults age 18 to 64, and/or adults age 65 and over)[19]
- Study question
- Description of study population, including the percentage of eligible individuals who participated and attrition where specified
- Description of intervention, including type of personnel involved and costs incurred in delivery where specified
- Study design
- Intervention effectiveness
- Cost impact of intervention

Finally, authors considered the potential of the evidence to support recommendations for decision makers to use when considering benefit packages for mental health and substance abuse prevention services in managed care contracts. For an intervention to be recommended, the following three criteria had to be met:

1. Two or more studies demonstrated their effectiveness
2. Feasibility of service provision within a managed care organization or referral setting was stated or, in the judgment of authors, implied
3. Appropriateness for managed care coverage from a cost perspective was documented or inferred

Results

Table 1 summarizes the 54 studies, including articles addressing mental health; substance use/abuse (tobacco, alcohol, and other drugs); and the effects of self-care, education, and clinical preventive services on health and associated medical care utilization. Only 13 studies (22%) included information about the cost impact of the intervention.[20–32]

Studies included persons of all ages. Adults age 18 to 64 were research subjects in 54% (29) of the articles.[20–24,28,29,31,33–53] Adolescents age 13 to 17 were studied in 26% (14 articles).[49,50,54–65] Ten studies[46,50,54–56,58–60,64,66] (19%) included children age 1 to 12 years; the same number addressed family units[27,46,54–56,63,66–69] and adults age 65 and over.[25,28,30,36,40,43,50,51,70,71] Infants under the age of 1 year were research subjects in six articles.[27,63,66,69,72,73] Five[26,27,32,66,69] of the articles reviewed (9%) included the prenatal/pregnancy stage.

Studies were conducted in diverse geographic areas and sociodemographic groups. Research designs ranged from meta-analyses to randomized trials to matched comparison groups, time series, and pretest-posttest.

The variety of interventions was considerable, including media, lectures, staff and parent training, group programs, home visits, one-to-one approaches, hands-on therapies, appointment reminders, environmental modification, and self-care options. Interventions were associated with positive attitude and behavior changes, biologic and physical improvements, higher mental health measures, lowered health risk, increased appointment keeping, and reduced medical services utilization.

For some of the preventive behavioral interventions, documentation was sufficient to support recommendations for decision makers to use when considering benefit packages for mental health

Table 1
Summary of articles reporting effective preventive behavioral health interventions

Authors	Study question	Subjects	Intervention	Design	Findings
Aktan et al, 1996[67]	How effective is a family skills training program for African American families in preventing substance abuse?	88 parents in substance use treatment; 88 of their children ages 6–12 Program completed by 50%–80% of participating families	Parent training, children's skills training, and family skills training courses	Non-equivalent comparison quasi-experimental, repeated measures, pre- and post-interviews, 6- and 12-month follow-up Rating: II-1†	Significantly positive effects on parents, children, and families
Altman et al, 1987[20]	What is the cost-effectiveness of three smoking cessation programs?	740 smokers participating in the Stanford (CA) Five City Project	Eight-session class; 6-week, incentive-based contest; self-help quit kit	Participants' self-selected intervention type; well-designed cohorts in multiple sites; no control groups Rating: II-2	Quit rates: class, 35%; contest, 22%; self-help, 21% Cost-effectiveness ratios highest for class, lowest for self-help kit
Beardslee et al, 1997[54]	Is it necessary for families to link cognitive information to family life experiences for sustained changes in behavior and attitudes to occur?	37 HMO families with at least one child age 8–15 and at least one parent who had experienced an episode of affective disorder	Six- to 10-session clinician-facilitated family intervention, two lectures in group format with no children present	Random assignment; pre-intervention, post-intervention assessment and follow-up assessment at 17 months Rating: I	Increased behavior and attitude changes among participants in clinician-facilitated intervention
Beardslee et al, 1996[55]	What is the long-term impact of two interventions designed to diminish risk to children in families with a parent who has an affective disorder?	28 HMO families with child age 8–14 and parent with past episode of affective disorder; 93% of sample retained through fourth assessment	Six- to 10-session clinician-facilitated intervention with couple, individual, and family meetings; two lectures by physicians	Random assignment; pre-intervention assessment and post-intervention assessments at 3 to 6 weeks, 9 to 12 weeks and 2 years Rating: I	Linking cognitive information to families' life experiences produced long-term behavior and attitude changes

Beardslee et al, 1997[56]	What are the long-term effects of two forms of preventive intervention designed (1) to increase families' understanding of parental affective disorder and (2) to prevent depression in children?	36 HMO families with a non-depressed child age 8–15 and a parent who had experienced an episode of affective disorder	Six- to 10-session clinician-facilitated intervention with family, parents, and each child; two lectures by physicians	Random assignment; pre- and post-intervention assessment with follow-up about 1.5 years after enrollment Rating: I	More changes in parents and children in the clinician-facilitated intervention group
Bien et al, 1993[33*]	How effective are relatively brief interventions in reducing alcohol consumption or achieving treatment referral for problem drinkers?	Over 6,000 problem drinkers in 44 different studies across 14 countries	Physician counseling, check-ins monthly with nurse and quarterly with physician; physician advice to reduce alcohol consumption with self-help information	12 randomized trials of brief referral or retention procedures, 32 controlled studies of brief interventions targeting drinking behavior Rating: I and II-1	Effective elements: feedback, emphasis on personal responsibility, advice to change, alternatives, empathy, self-efficacy enhancement
Bottomly, 1997[34]	Do adult group interventions reduce the psychological distress associated with cancer and provide other mental health benefits?	In 27 studies, adults with cancer participating in supportive or structured psychoeducational group interventions; 6 to 157 subjects per study	Supportive group interventions or highly structured psychoeducational group interventions	Review of 27 studies included small, non-randomized samples, non-intervention control groups, randomized studies; no follow-up to 24-month follow-up Rating: I and II-1	Group interventions may offer mental health benefits; structured interventions may provide more benefits than supportive interventions
Clarke et al, 1995[57]	Can unipolar episodes in a sample of high school adolescents with an elevated risk of depressive disorder be prevented?	150 9th and 10th grade adolescents in three suburban high schools chose to participate out of 172 eligible (87.2%)	15-session cognitive group program led by psychologists/ counselors; no restrictions on usual care group	Random assignment to prevention or usual care group; 1-year follow-up Rating: I	About 50% less incidence of unipolar depressive disorder in intervention group than usual care group at follow-up

Continues

Table 1
(Continued)

Authors	Study question	Subjects	Intervention	Design	Findings
Cummings et al, 1989[21]*	What is the cost-effectiveness of physician counseling against smoking?	Hypothetical male and female adult smokers seen during routine office visits	4 minutes of advice to quit smoking, self-help booklet, 1-year follow-up visit	Estimated costs of physician time and self-help materials, counseling effectiveness and intervention benefits Rating: N/A (subjects hypothetical)	Physician counseling calculated to increase the 1-year cessation rate by 2.7% with 10% relapse; per year of life saved, cost ranged from $705–$988 for men and $1,204–$2,058 for women
Devine & Cook, 1983[35]*	Do brief psychoeducational interventions affect length of postsurgical hospitalization?	Adult surgical patients in 49 studies published between 1964 and 1982	Information, training, and/or psychosocial support from a health care provider	Literature review of 37 experimental designs with random assignment; 12 quasi-experimental designs Rating: I and II-1	Hospital stays reduced by about 1 1/4 days
Devine et al, 1988[36]*	How does a workshop for staff nurses on providing patient education and psychosocial support affect patient welfare and recovery?	354 adult elective surgical patients age 18–90; 64.8% of those eligible participated	Two-session, 3-hour workshop for registered nurses	Post-test-only institutional cyclic cohort design with nonequivalent control group Rating: II-3	Experimental subjects used fewer sedatives, antiemetics, and/or hypnotics and were discharged 1/2 day sooner than controls
Devine & Reifschneider, 1995[37]	How does psychoeducational care affect adults with hypertension?	Adults with hypertension participating in 88 studies between 1965 and 1993	Teaching, behavioral interventions, and/or psychosocial support	Experimental, quasi-experimental, or pre- or post-single group (at least five subjects per treatment group) Rating: I, II-1, & III	Significant effects on knowledge and compliance

Durlak, 1998[58]	What common risk and protective factors emerge from successful prevention programs?	Children and adolescents	Not described	Review of 1,200 exemplary prevention outcome studies (ie, carefully conceptualized, conducted, and evaluated) Rating: I and II-1	Multilevel interventions achieved best results, including significantly fewer problems, improved adjustment, or both
Durlak & Wells, 1998[59]	What are the outcomes of indicated preventive mental health interventions in children and adolescents?	Youth age 18 or younger participating in secondary prevention outcome studies; attrition was less than 10% in 80% of studies	Environment-centered interventions, transition programs, or person-centered interventions in various settings	Meta-analysis of 99 published and 22 unpublished reports; 25% provided follow-up data Studies involve secondary MH intervention compared with control group, drawn from same population Rating: II-1 and II-2	Average participant in behavioral or cognitive-behavioral intervention surpassed the performance of about 70% of those in control group
Durlak & Wells, 1997[60]	What is the impact of primary prevention programs on behavioral and social problems in children and adolescents?	Youth age 18 or younger participating in primary prevention outcome studies; mean age 9.3 years	Environment-centered interventions, transition programs, or person-centered programs in various settings	Meta-analysis of 150 published and 27 unpublished reports; 25.4% provided follow-up data Rating: II-2	Outcomes reflected an 8% to 46% difference in success rates favoring prevention groups
Eakin et al, 1989[61]	Does a multi-component treatment program help male adolescents quit using smokeless tobacco?	25 of 34 males between the ages of 14 and 18 who had used smokeless tobacco regularly	Three meetings lasting 60–90 minutes with two to three youths and two to three counselors; participants were paid to attend	Within-subject, replicated AB design with quasi-experimental comparison group of 11 subjects (delayed treatment) Rating: II-3	43% quit at end of program; cessation rate was 12% at 6 months

Continues

Table 1
(Continued)

Authors	Study question	Subjects	Intervention	Design	Findings
Egbert et al, 1964[38*]	How do instruction, suggestion, and encouragement affect the severity of postoperative pain?	97 patients undergoing elective intra-abdominal surgery	Pre- and postsurgical visits from anesthetist for teaching and encouragement until narcotics were discontinued	Random assignment to special care or control group Rating: I	Fewer requests for narcotics and 2.7-day earlier discharge in special care group
Field, 1995[72]	How does early intervention affect the impact of maternal depression on infant growth, development, and behavior?	Depressed mothers and their infants studied by multiple researchers	Music mood induction, yoga, visual imagery, aerobics, relaxation, massage therapy, interaction coaching, and infant touching	Sample of convenience; descriptive study Rating: III	Positive results from music mood induction and from massage therapy for mothers and infants
Field et al, 1996[73]	Does massage therapy benefit healthy infants born to depressed mothers?	40 full-term, 1- to 3-month old infants born to depressed adolescent mothers	15-minute massage or 15 minutes of rocking twice weekly for 6 weeks	Random assignment of infants to massage or rocking group Rating: I	Massage group gained more weight, had an improved temperament, and had decreased urinary catecholamine, cortisol, and serotonin levels
Field et al, 1996[62]	What are the comparative effects of massage and relaxation therapies on depressed adolescent mothers?	32 depressed adolescent mothers who had recently given birth in a large, inner-city hospital	Two 30-minute massages or relaxation therapy sessions weekly for 5 weeks	Random assignment to massage therapy or relaxation therapy group Rating: I	Behavioral and stress hormone changes and decreased urine cortisol levels in massage therapy group

Field et al, 1998[68]	How does intervening with polydrug-using adolescent mothers affect them and their drug-exposed infants?	126 mothers age 16–21 with low socioeconomic status	4 months of drug and social rehabilitation, parenting and vocational classes, and relaxation therapy	Comparisons of drug control, drug rehabilitation, and non-drug groups of mothers and their infants at 3, 6, and 12 months Rating: II-1	Less depression and stress, lower incidence of repeat pregnancy and drug use in drug rehabilitation group
Field et al, 1982[63]*	What is the comparative impact of home-visit and nursery parent-training interventions on teenage mothers and their infants?	120 teenage mothers and their infants recruited from a large university hospital neonatal nursery	Biweekly home visits for 6 months to train mothers in infant stimulation or parent training; job training and payment for work in an infant nursery	Random assignment to home-visit, nursery, and control groups with follow-up assessments at 4 months, 8 months, 1 year, and 2 years Rating: I	More mothers returned to work/school and had lower incidence of repeat pregnancy in nursery group; better results for home-visit group than for control group
Finney et al, 1991[64]*	What is the impact of psychological treatment for children with common behavior, toilet, school, and psychosomatic problems?	59 boys and 34 girls age 1–15 with appointments for evaluation by an HMO's behavioral pediatrics service	One to six targeted 50-minute behavioral therapy sessions for children and their parents; most received telephone follow-up	Comparison group of plan enrollees matched for age, gender, and receipt of pediatric primary care on same day as treated child Rating: II-1	76% of parent-reported problems resolved or improved; medical encounters reduced for children with behavior or toilet problems
Fiscella & Franks, 1996[22]	What is the incremental cost-effectiveness of the transdermal nicotine patch?	Male and female smokers age 25–69 receiving primary care	Assumed that physician provided cessation counseling and patch prescription (50% would accept and 95% of them would use)	Decision analytic model of the incremental cost-effectiveness of adding the patch to physician smoking cessation counseling Rating: N/A	Incremental cost-effectiveness per quality-adjusted life year ranged from $3,390–$10,943

Continues

Table 1
(Continued)

Authors	Study question	Subjects	Intervention	Design	Findings
Fleming et al, 1997[39]*	Does brief physician advice reduce alcohol use and health care utilization in problem drinkers?	482 men and 292 women met study criteria; 95% participated in 12-month follow-up; clinic-specific refusal rate was 2%–30%	Two 10–15 minute counseling interventions 1 month apart; follow-up call from nurse (health booklet for control group)	Randomization into experimental and control groups Rating: I	At 1-year follow-up, significant reductions in 7-day alcohol use, binge drinking episodes, and frequency of excessive drinking
Fleming et al, 1999[70]*	What is the effect of brief physician advice on alcohol use and health care utilization among older adult problem drinkers?	105 men and 53 women age 65–75 (from a pool of 6,693 patients of 43 physicians in 24 Wisconsin clinics)	Two 10–15 minute physician visits with health behavior workbook, drinking agreement, and drinking diary cards; 2-week follow-up call from nurse	Men and women separately randomized into intervention ($n = 87$) or control group ($n = 71$); 12-month follow-up rate was 92.4% Rating: I	Weekly alcohol use decreased 40% at 3 months and 36% at 12 months
Fries et al, 1992[40]*	What is the impact of a low-cost, mail-focused health promotion program?	Healthtrac enrollees 1986–1990; 135,093 under age 65 and 129,982 over age 65; at 30-month follow-up, 505 in program	Health habit questionnaire, computer-based serial personal health risk report, physician-signed individualized recommendation letter	Prospective, longitudinal, observational study with concurrent comparison group Rating: II-2	At 30 months, risk scores improved 18.8% in 65+ group and 25.7% in under-65 group; cost was $30 per person per year
German et al, 1995[71]	What is the acceptability and effect of preventive services under Medicare waivers to a community-dwelling population?	2,105 subjects in intervention group, 2,090 subjects in control group (of 12,111 screened and 5,281 eligibles age 65 and over)	Physician examination, history and evaluation; laboratory procedures and immunizations; and counseling for health risks	Random assignment to intervention and control groups Rating: I	15% fewer medical visits in intervention group; $36.65 saved per household; $2.19 saved for every intervention dollar spent

Goldberg et al, 1981[41]*	What is the impact of short-term psychiatric therapy on outpatient medical service utilization?	483 index cases, 483 matched controls, 550 family member index cases, and 263 matched family member controls in a prepaid group practice	Short-term psychotherapy from a psychiatrist or other registered psychotherapist on an approved list of community practitioners	Index cases compared with matched controls from 12 months prior to until 12 months following referral to psychiatry for evaluation Rating: II-2	Significant decrease in medical hospitalization among index cases
Green et al, 1978[23]	How much would it cost to replicate behavioral methods of smoking cessation on a large scale?	Participants in 43 smoking cessation studies with data needed to analyze cost-effectiveness	Interventions included drugs, hypnosis, behavior modification, education and group support, and aversive conditioning	Consistent rules applied to estimating costs relative to effect Rating: N/A	The most cost-effective interventions cost $15 or less per unit of abstinence
Heather et al, 1987[42]	How effective is a controlled drinking, minimal intervention for problem drinkers?	78 men and 26 women, mean age 36.4 years, who reported weekly consumption of more than 35 units for men and 20 units for women	Physician leaflet and medical record card, blood tests, medical questionnaire, 2-week drinking diary card, self-help book on controlled drinking	Random assignment to controlled drinking intervention group, simple advice group, or nonintervention control group; 88% follow-up at 6 months Rating: I	Significant reductions in alcohol consumption for the entire sample; no significant differences between groups in alcohol consumption reductions
Kemper, 1982[24]*	What is the impact of a medical self-care program on utilization and cost of in-clinic and referral visits in a prepaid group practice?	163 of 6,000 members of a prepaid group practice health plan in Boise, Idaho invited to attend a new health education class	Ten 2-hour workshops led by a nurse practitioner and a 250-page self-care guide	Subjects expressing interest in attending the class were randomly assigned to experimental and control groups Rating: I	Program cost about $65 per participating family; savings averaged $101.27 per person

Continues

Table 1
(Continued)

Authors	Study question	Subjects	Intervention	Design	Findings
Kemper et al, 1993[43]*	How effective are medical self-care interventions in reducing utilization?	Participants in 15 studies of HMO households, senior citizens, Medicare households, and retirees	Nurse practitioner–led workshops, written materials, health risk appraisal, telephone information, counseling, presentations, physician letters, self-care center, slide-tape show	Randomization, staggered time-series intervention, pre- and post-testing Rating: I	Some studies reported decreases in utilization between 7.2% and 24%
Leigh et al, 1992[25]*	What is the impact of a worksite health promotion intervention on health status?	919 experimentals (of 1,887); 867 questionnaire only (of 1,892); 1,907 unobtrusive controls 919 experimentals (46%) still involved at 1 year	Lifestyle questionnaires every 6 months, personal health risk reports, individualized physician recommendation letters, written materials	33 retiree clubs divided into 11 matched groups of three; sets of matched clubs randomly allocated to one of three study groups Rating: I	Direct costs decreased by 22% in experimental group; $5 saved in direct costs for every program dollar spent
Maccoby et al, 1977[44]	What are the effects of a community-based campaign on health knowledge and behavior?	Adults between the ages of 35 and 59 living in one of three California towns	Multimedia campaign in English and Spanish; intensive instruction program	Quasi-experimental with three groups: media only, media plus instruction, control Rating: II-1	Media plus instruction most effective intervention for high-risk participants
Marks et al, 1990[26]*	What is the cost-effectiveness of a smoking cessation program for pregnant women to reduce low birth weight and perinatal mortality?	1986 birth cohort of 3,731,000 infants, of whom 783,510 were born to women who smoked during pregnancy	Model intervention by a nurse practitioner; 15-minute counseling session, materials, two follow-up telephone calls	Estimates drawn from Medical Care Price Index adjusted to 1986 dollars and from 1985–1986 Behavioral Risk Factor Surveillance System Rating: N/A	Smoking cessation programs could save $77,807,054, or $3.31 per $1 spent, compared with caring for low-birth-weight infants

Morisky et al, 1983[45]	What are long-term program effects on weight control, appointment keeping, blood pressure, and mortality?	400 adults with hypertension, mean age 54.1 years	5- to 10-minute individualized medical care exit interview; home-based instructional session with another adult in household; three 1-hour group sessions	Randomized factorial design: 200/200 got exit interview; 160/200 got home visit; 96/200 attended at least one group session Rating: I	5-year effect on weight, blood pressure, and appointment keeping; 57.3% less mortality, 53.2% less hypertension-related mortality
Mullen & Zapka, 1981[46]	What are the results of selected health education studies that were conducted in HMOs or that are applicable to HMOs?	Primarily adults, though some studies included children as well	Group education, appointment reminders, home visits, childbirth classes, counseling, algorithms, self-care centers	Not described Rating: N/A	Outcomes included reduced utilization, decreased diabetic ketoacidosis and amputation, reduced medication use
Mumford et al, 1982[47*]	How does psychological intervention influence health and use of medical services?	Primarily adults, though some studies included children as well	Relaxation, group sessions, preoperative teaching, audiovisuals, group therapy, systematic desensitization, puppet therapy, hypnotherapy	Quantitative review of 34 controlled studies; meta-analysis of psychological intervention Rating: I and II-1	Average psychological intervention reduced hospitalization by about 2 days; effect size for all 210 outcome indicators averaged +.49
Olds et al, 1997[69]	What are the long-term effects of prenatal and early childhood home visitation by nurses?	400 at-risk pregnant women enrolled of 500 invited to participate	Sensory and developmental screening for children at 12 and 24 months; free taxicab vouchers for health care; home visits by nurse	4 treatment conditions; families randomized; at 15-year follow-up, 81% of original subjects assessed Rating: I	Fewer subsequent pregnancies and live births, greater spacing between births, less alcohol or drug impairment

Continues

Table 1
(Continued)

Authors	Study question	Subjects	Intervention	Design	Findings
Olds et al, 1993[27]*	Do improvements associated with a prenatal and infancy nurse home visitation intervention translate into government savings?	400 at-risk pregnant women enrolled of 500 invited to participate	Sensory and developmental screening for children at 12 and 24 months; free taxicab vouchers for health care; home visits by nurse	Families randomized to one of four treatment conditions; at 15-year follow-up, assessment completed on 81% of original subjects Rating: I	Fewer subsequent pregnancies and live births, greater spacing between births, less alcohol/drug impairment; cost recovery, $180 dividend per family
Pelletier, 1996[28]	What are the health and cost outcomes of worksite-based comprehensive health promotion and disease prevention?	Employees and/or retirees in 26 studies published in peer-reviewed journals; sample sizes from 80 to 54,902	Lifestyle management, risk appraisal, materials, classes, environmental changes, recognition, counseling, television, social support, incentives	Cross-sectional analysis, random assignment, longitudinal pre- and post-design, time-lagged nonequivalent comparison groups, quasi-experimental design Rating: I, II-1 to II-3	Included fewer physician visits and hospitalizations, 30% smoking cessation at 2 years; 20% lower first-year medical costs; benefit/cost ratio of $1:$3.6
Ramey & Ramey, 1992[66]*	What are the long-term effects of prenatal and early childhood home visitation by nurses on women?	Three studies: study 1, children from intellectually and economically poor families; study 2, poverty-level mothers and children; study 3, 1,000 children and families with infants born prematurely with low birth weight	Study 1, intensive early preschool education at center; study 2, home-based teaching for mothers compared with center-based program for children; study 3, home visits through year 3 and center-based program for children	All three studies used random assignment Study 1: intervention group and control group; study 2: home treatment group, center treatment, and control groups; study 3: intervention and control group Rating: I	Higher intelligence quotient in intervention than control groups; reductions in mental retardation

Rippe et al, 1998[48]	What are the effects of a weight loss intervention on psychological well-being, quality of life, and health practices in moderately obese women?	80 women 20–49 years old, weighing 20%–50% more than a 1983 insurance table of desirable weight for height	12-week Weight Watchers International program: weekly group support meetings, self-selected diet, food diaries, discussion of exercise	Single-center, randomized prospective trial with an intervention group and a control group that maintained current eating and exercise patterns Rating: I	Intervention group lost significant weight and significantly improved physical function, vitality, mental health, and exercise
Rosen & Wiens, 1979[49]	Can psychological services reduce medical problems and use of medical facilities?	468 patients referred to psychology outpatient clinic from university health center between 1970 and 1975	Comprehensive intake interview, diagnostic evaluation, therapeutic intervention	Four groups: evaluation and treatment; evaluation; referral not kept; and not referred Rating: II-1	Reductions in medical outpatient visits, prescriptions, emergency department visits, diagnostic services, hospital days
Roter et al, 1998[50]	What is the effectiveness of interventions to improve patient compliance with medical regimens?	Review of 153 studies of adults 18–64; adults 65 and over; adolescents, children, or caretakers; and providers	Individualized educational, behavioral, affective, or provider-focused interventions	Meta-analysis of 153 studies meeting six criteria, one of which included a control group Rating: II-1 to II-2	Interventions produced significant effects for all compliance indicators, including health outcomes and utilization
Schneider et al, 1995[51]	How effective are two stress reduction approaches to the treatment of mild hypertension in older African Americans?	213 African Americans age 55 or older with mild hypertension screened; 127 randomized to treatment; 111 finished study	Transcendental meditation (TM) and progressive muscle relaxation (PMR); lifestyle modification education control group	Controlled, single-blind trial with eligible participants randomized to three study groups for 3-month intervention period Rating: I	Significantly greater reductions in systolic and diastolic blood pressure in the TM group than in the PMR group

Continues

The Journal of Behavioral Health Services & Research [JBHSR] AS123-01 June 24, 2002 11:10

Table 1
(Continued)

Authors	Study question	Subjects	Intervention	Design	Findings
Shipley et al, 1988[52]	How effective is a worksite-based smoking cessation program?	79 of 381 baseline smokers employed by LIVE FOR LIFE companies participated in the clinic	Environment supportive of nonsmoking lifestyle; 3-hour lifestyle seminar; behavioral quit-smoking clinic	Quasi-experimental; assignment to intervention or health screen only based on balanced demographics Rating: II-1	After 2 years, 31.6% clinic participant quit rate; 20.2% in non-participants; 17.4% in health screen only group
Smith et al, 1995[29]	What are the effects of a psychiatric consultation intervention on management of somatization disorder and medical care costs?	56 of 151 patients with history of multiple unexplained somatic complaints met study criteria; all agreed to enroll	Psychiatric consultation letter sent to patients' physicians explaining somatization syndrome, suggesting course and type of treatment	Prospective randomized controlled trial with one-way crossover from control to intervention at 1-year follow-up Rating: I	Significantly better physical functioning 1 year after intervention; 32.9% reduction in annual median cost of health care
Tobler, 1992[65]	How effective are drug prevention programs for adolescents?	Adolescents in 143 programs to reduce teenage drug use and abuse	Knowledge only, affective only, peer programs, knowledge plus affective, alternatives	Meta-analysis; 48.9% experimental, 51.1% quasi-experimental designs Rating: I to II-1	Peer programs had highest effect size for all measures, including smoking, alcohol, and hard drug use
Vickery et al, 1988[30*]	What are the effects of a self-care communication-based program on ambulatory care utilization?	1,249 individuals Medicare-enrolled in a prepaid group health program; only 9 declined to participate	Letter, written materials, two self-care packages for people over age 60, telephone information service	Random assignment of subjects to experimental or control group Rating: I	Total medical visits decreased 15% in experimentals as compared with controls; medical visit decreases saved $36.65 per experimental household; cost/benefit ratio of $2.19 for every $1 spent on intervention

Vickery et al, 1983[31]*	What is the effect of a self-care educational intervention on ambulatory care utilization in an HMO?	11,090 households enrolled in a prepaid group health plan were invited to participate; 2,833 accepted and 1,625 participated	Written materials, health risk appraisal, telephone information service, health evaluation and plan, follow-up call	Randomization to one of four groups: materials plus telephone information plus counseling; materials plus telephone information; materials; no intervention Rating: I	Decreases in total medical visits (17%) and minor illness visits (35%); estimated savings of $2.50–$3.50 for each intervention dollar spent
Windsor et al, 1993[32]*	What is the behavioral impact of health education interventions with pregnant smokers?	1,171 pregnant smokers screened: 1,061 eligible, 67 refused participation; 994 enrolled	15-minute cessation counseling and cessation guide, medical letter, social support	Prospective, randomized, pretest–post-test control group design Rating: I	Quit rates: 14.3% experimental, 8.5% control; estimated cost/benefit ratios $1:$6.72 to $1:$17.18
World Health Organization Brief Intervention Group, 1996[53]*	What are the relative effects of simple advice and brief counseling with heavy drinkers?	75% of 1,559 eligible patients initially recruited through eight collaborating centers	Interview and pamphlet for all; 15 minutes of counseling and manual for brief counseling group; 5 minutes of advice for simple advice group	Randomized clinical trial; eligible patients randomized to brief counseling group, simple advice group, or control group Rating: I	Intervention groups had significantly greater drinking reductions than controls: simple advice, 27%; brief counseling, 21%; controls, 7%

HMO, health maintenance organization; MH, mental health

*Study is used to support one of six recommendations.

†See Table 2 for the meaning of design ratings.

and substance abuse prevention services in managed care contracts. As previously stated, for an intervention to be recommended, the following three criteria had to be met:

1. Two or more studies demonstrated their effectiveness
2. Feasibility of service provision within a managed care organization or referral setting was stated or, in the judgment of authors, implied
3. Appropriateness for managed care coverage from a cost perspective was documented or inferred

The six types of preventive interventions that satisfied these criteria and the articles supporting the recommendation are discussed individually below.

Prenatal and infancy home visits

This research[27,63,66] involved women with high-risk pregnancies; teenage mothers; low-income, first-time mothers; and low-birth-weight infants born prematurely. Periodic home visits began during the prenatal period and continued in some studies until the child reached 3 years of age. Either a nurse or a team comprised of a psychology graduate student and a Comprehensive Education Training Act (CETA)[63] aide conducted the home visits. In one study, the home visit focused on maternal functioning,[27] while the others concentrated on training mothers to stimulate their infants.[63] Results included fewer additional pregnancies and live births, increased spacing between births, reduced alcohol and drug impairment, fewer arrests and days in jail, less use of Aid to Families with Dependent Children (AFDC), reduced child abuse and neglect among mothers receiving home visits, improved weight and scores on motor developmental tests among infants whose mothers were visited, and decreased incidence of mental retardation among infants whose mothers received the intervention.[27,63,66]

Targeted cessation education and counseling for smokers, especially pregnant smokers

These studies[21,26,32] involved pregnant smokers recruited through county maternity clinics, a birth cohort of women who smoked during pregnancy, and a hypothetical group of male and female smokers receiving routine medical care. A variety of interventions was evaluated, including a 15-minute counseling session with a nurse or health educator, supplemented by written materials and two follow-up telephone calls; a 15-minute counseling and skill development session with a trained health counselor, supplemented by clinical patient reinforcement, social support, newsletter information, and mention in a prenatal education class; and 4 minutes of physician advice to quit smoking, supplemented by a self-help booklet and a 1-year follow-up visit. The birth cohort study estimated savings of $3.31 of the cost of caring for low-birth-weight infants in a neonatal intensive care unit for every dollar spent on smoking cessation. In the hypothetical patient group, brief physician advice was associated with a 2.7% increase in the cessation rate at 1 year. The maternity clinics experienced a 14.3% quit rate in the intervention group, contrasted with an 8.5% quit rate in the control group.

Targeted short-term mental health therapy

These studies[41,64] explored the effect of short-term mental health therapy. In one study,[64] children up to the age of 15 received one to six targeted behavioral therapy sessions, along with their parents, from doctoral-level pediatric psychologists or predoctoral clinical psychology interns. Medical encounters were reduced by almost one third by children with behavioral problems and by nearly one half among those with toileting problems. Individuals who sought short-term psychotherapy from a psychiatrist or other registered psychotherapist required significantly fewer days of medical

hospitalization than matched controls. While no cost data were presented, the authors suggested that costs decreased due to the offset effect of reduced medical visits.

Self-care education for adults

Five of these studies[24,25,30,31,40,43] were conducted in managed care organizations, addressing health promotion and self-care issues that encompassed substance use and mental health. Interventions included group education workshops led by a nurse practitioner, supplemented by a self-care guide and videotapes, a telephone information service staffed by a nurse coordinator, and an individual health evaluation and a planning conference with a trained nurse; computer-based, serial, personal health risk reports augmented by individualized recommendation letters and written materials; access to a self-care center; one-on-one education sessions with physicians; and slide-tape shows. One study estimated 28% savings in laboratory costs and 24% savings in X-ray costs between experimental and control groups.[24] Another study estimated a 17% decrease in total medical visits, and a 35% decrease in minor illness visits in experimental versus control groups.[31] There were significant improvements in health risk behaviors, including smoking, alcohol use, and reported stress[25,40]; decreases in ambulatory physician visits ranging from 7.2% to 24%[43]; and a decrease of 15%[30] in total medical visits in the experimental groups compared with controls.[30] In another study, for every program dollar spent, an estimated $5 in direct health costs was saved for physician visits and hospitalizations.

Presurgical educational intervention with adults

The interventions in these studies[35,36,38,47] included a workshop to enable staff nurses to provide psychoeducational care to adult surgical patients; patient information about what to expect; skills training to help patients prevent complications or reduce anxiety; psychosocial support from a health care provider to reduce anxiety or enhance ability to cope with hospitalization, supplemented by printed and taped materials; and visits to patients by an anesthetist before and after surgery to provide information and self-care guidance. Findings included less use of sedatives, antiemetics, hypnotics, and narcotics as well as earlier discharge from the hospital.

Brief counseling and advice to reduce alcohol use

Studies[33,39,53,70] in the United States and abroad evaluated physicians, nurses, psychologists, and other professionals providing between 5 and 15 minutes of advice or counseling on reducing alcohol consumption. In some studies, subjects also received a workbook and informational or self-help materials. Reinforcement strategies included follow-up visits or telephone calls. Results showed significant reductions in alcohol consumption.

Discussion

These 54 articles demonstrate that preventive interventions for mental health and substance abuse appropriate for managed care settings have been evaluated and shown to be effective. Many of the interventions produced positive health-related outcomes and cost savings or offset health care costs that would otherwise have been incurred, although fewer than half of the studies addressed the cost impact of the intervention. Successes were reported individually at every age level, from the prenatal/pregnancy period through older adulthood, as well as in families.

For many reasons, it was difficult to identify this body of literature. Peer-reviewed articles were scattered among journals in many fields, including public health, medicine, mental health, and substance abuse. Without key words that precisely described the subject matter of interest, database

Table 2
Key to design ratings: Quality of evidence

Rating	Meaning
I	Evidence obtained from at least one properly randomized controlled trial
II-1	Evidence obtained from well-designed controlled trials without randomization
II-2	Evidence obtained from well-designed cohort or case control analytic studies
II-3	Evidence obtained from multiple time series with or without the intervention (Dramatic results in uncontrolled experiments [such as the results of the introduction of penicillin treatment in the 1940s] are examples of this type of evidence)
III	Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees
N/A	Rating not applicable due to hypothetical subject, cost analyses only, or insufficient information provided

Source: Adapted with permission from *Guide to Clinical Preventive Services: Report of the US Preventive Services Task Force*, Lippincott Williams & Wilkins, 1989, p. 388. Methodology adapted from the Canadian Task Force on the Periodic Health Examination.

searches required the casting of an extremely large net, which pulled in far more inappropriate than appropriate articles. On the other hand, it is possible that due to varied terminology in the arena of preventive behavioral health interventions, published studies that met review criteria may have evaded the extensive search for articles.

Publication in a peer-reviewed journal was a criterion for inclusion as an indicator of quality. Because there is variability in journal standards and procedures, however, journal peer review may not be a consistent proxy. This criterion also resulted in the exclusion of conference proceedings, consensus panel reports, unpublished research, and other sources that may have been relevant. To further assess the quality of published studies included in this review, each study's research design was rated, using a scale of methodological rigor first created by the Canadian Task Force on the Periodic Health Examination and later employed by the US Preventive Services Task Force[74] (see Tables 1 through 3).

Of the 54 studies identified, 33 (61%) included randomization of subjects in a properly controlled trial, the most rigorous design. Of the 22 studies that supported the six services recommended for coverage, close to three fourths (16 out of 22, or 72%) included an experimental design with randomization, the highest level of rigor (see Table 3). An assessment of the relative strength of the support for the six recommendations based on methodological rigor shows that the strongest are prenatal and infancy home visits (three studies with I rating), self-care for adults (five of six studies have I rating), and brief counseling to reduce alcohol use (all four studies with at least an I rating). Equally well documented is the recommendation on targeted cessation for pregnant smokers (three favorable studies with one true experimental design I rating); however, two of the three supporting publications could not be rated due to the use of hypothetical subjects or cost projections. The recommendations supported by comparatively weaker evidence include targeted short-term therapy (two studies, one with a II-1 rating; one with a II-2 rating) and presurgical educational/psychological intervention with adults (four studies, two with at least a I rating and two with a II-1 or II-3 rating).

Due to the length of time that elapses from completion of studies to publication, results of current research projects with the potential to make a significant contribution to this project were not yet available in the peer-reviewed literature. Research that did not support the effectiveness of preventive

Table 3
Six recommendations, supporting studies, and design ratings

Recommendation	Authors	Study design rating
1. Prenatal and infancy home visits	Field et al, 1982[63]	I
	Olds et al, 1993[27]	I
	Ramey and Ramey, 1992[66]	I
2. Targeted cessation education and counseling for smokers, especially pregnant smokers	Cummings, Rubin, and Oster, 1989[21]	NA
	Marks et al, 1990[26]	N/A
	Windsor et al, 1993[32]	I
3. Targeted short-term mental health therapy	Finney et al, 1991[64]	II-1
	Goldberg et al, 1981[41]	II-2
4. Self-care education for adults	Fries et al, 1992[40]	II-2
	Kemper, 1982[24]	I
	Kemper et al, 1993[43]	I
	Leigh et al, 1992[25]	I
	Vickery et al, 1983[31]	I
	Vickery et al, 1988[30]	I
5. Presurgical educational intervention with adults	Devine and Cook, 1993[35]	I & II-1
	Devine et al, 1988[36]	II-3
	Egbert et al, 1964[38]	I
	Mumford, Schlesinger, and Glass, 1982[47]	I & II-1
6. Brief counseling and advice to reduce alcohol use	Bien, Miller, and Tonigan, 1993[33]	I & II-1
	Fleming et al, 1997[39]	I
	Fleming et al, 1999[70]	I
	WHO, 1996[53]	I

behavioral health interventions may not have been submitted or accepted for publication. An update of this review is in the planning phase to include literature published after mid-1999.

Search procedures located few studies of preventive behavioral health interventions that took place in managed care organizations. Although research conducted in other health care and community-based referral settings may be generalizable to managed care, most of the published articles lacked details that managed care organizations need for application to practice, such as information about the penetration rate, a complete description of the intervention, staffing requirements, and associated costs.

Some of the studies that provide the empirical basis for the conclusions of this review date back several years. Unless the same authors published results of similar studies at a later date, it was not possible to prospectively track the research questions to ensure that the cited findings had not been challenged by subsequent attempts at replication.

In order to recommend an intervention for managed care coverage, the authors established the three criteria listed previously. Many of the interventions that met the seven criteria for inclusion in this article did not satisfy the additional three criteria required for a recommended service because only one published article documenting the effectiveness of an intervention was identified; the feasibility of providing the intervention in a managed care or referral setting was not established; or the cost advantage, cost offset, or cost neutrality of the intervention was not apparent. It is possible that ongoing intervention research will generate the additional evidence for future recommendations.

Implications for Behavioral Health Services

Although the knowledge base is incomplete and imperfect, useful information exists now for evidence-based decision making about preventive behavioral health coverage for managed care enrollees. Efforts to generate, translate, and disseminate research findings to managed care decision makers about preventive programs and services for mental health and substance abuse should be expanded.

Much work remains to be done to solidify and expand this knowledge base. Steps that might be taken to bridge gaps in research and its application to managed care practice include the following:

- Expand resources for research on the effectiveness and cost impact of preventive behavioral health interventions, especially in health care settings.
- Follow up preliminary positive findings with replication studies and, where appropriate, adapt interventions to other populations and settings.
- Encourage investigators to undertake this research in managed care organizations.
- Establish research partnerships with managed care organizations for the conduct of intervention studies within their enrolled populations.
- Require study and analysis of cost impact as a condition of intervention research funding.
- Work with researchers whose publications do not contain cost information to generate cost projections.
- Provide financial support for graduate and postgraduate students who undertake research in this arena to increase the number of new investigators who pursue prevention research in substance abuse and mental health as a primary career focus.

The evidence identified in this review demonstrates that there is a body of research that supports the provision of preventive programs and services for mental health and substance abuse appropriate for managed care settings. Evaluations of a number of these interventions produced or showed potential for cost savings or offset health care costs that would otherwise have been incurred. These findings can be used now by managed care decision makers while research continues.

Acknowledgment

The authors acknowledge the contributions of Nancy Kennedy, DrPH, and Charlie Williams, MHS, CEAP, Office of Managed Care, Center for Substance Abuse Prevention, to this project.

References

1. Murray CJL, Lopez AD, eds. *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020 (Summary)*. Geneva, Switzerland: World Health Organization; 1996:1–43.
2. McGinnis JM, Foege WH. Actual causes of death in the United States. *Journal of the American Medical Association*. 1993;270:2207–2212.
3. US Dept of Health and Human Services. *Healthy People 2010*. 2nd ed. Washington, DC: Government Printing Office; 2000.
4. *Mercer/Foster Higgins National Survey of Employer-Sponsored Health Plans 1999*. New York: William Mercer, Inc; 2000.
5. US Dept of Health and Human Services. *National Summary of Medicaid Managed Care Programs and Enrollment*. Washington, DC: Health Care Financing Administration; 1999.
6. US Dept of Health and Human Services. *HCFA To Offer Extra Payments for Care of Congestive Heart Failure; Medicare + Choice Organizations Will Benefit in 2002*. Washington, DC: Health Care Financing Administration; 2000.
7. Coffee RM, Mark T, King E, et al. *Health Care Spending: National Expenditures for Mental Health and Substance Abuse Treatment 1997*. Rockville, MD: Center for Substance Abuse Treatment and Center for Mental Health Services, Substance Abuse and Mental Health Services Administration; 2000.
8. Kessler RC, McGonagle KA, Zhao S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the US: results from the National Comorbidity Survey. *Archives of General Psychiatry*. 1994;51:8–19.
9. US Dept of Health and Human Services. *Mental Health: A Report of the Surgeon General*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health; 1999.

10. US Dept of Health and Human Services. *Understanding Substance Abuse Prevention toward the 21st Century: A Primer on Effective Programs*. Rockville, MD: Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration, US Dept of Health and Human Services; 1999.
11. Commission on Chronic Illness. *Chronic Illness in the United States*. Cambridge, MA: Harvard University Press; 1957;1.
12. Gordon R. An operational classification of disease prevention. *Public Health Reports*. 1983;98:107–109.
13. Mrazek PJ, Haggerty RJ, eds. *Reducing Risks for Mental Disorders: Frontiers for Prevention Intervention Research.* Washington, DC: National Academy Press; 1994.
14. Mrazek PJ. *Preventing Mental Health and Substance Abuse Problems in Managed Care Settings.* Alexandria, VA: National Mental Health Administration; 1998.
15. National Institute of Mental Health. *Priorities for Prevention Research at NIMH: A Report by the National Advisory Mental Health Council*. Bethesda, MD: Department of Health and Human Services; 1998.
16. Mullen PD, Zapka JG. Health education and promotion in HMOs: the recent evidence. *Health Education Quarterly*. 1981;8:292–315.
17. Buck JA, Teich JL, Umland B, et al. Behavioral health benefits in employer-sponsored health plans. *Health Affairs*. 1999;18:67–78.
18. Center for the Advancement of Health. *Health Behavior Change in Managed Care: Evidence Tables on Alcohol and Other Drugs, Depression and Smoking Cessation.* Washington, DC: Center for the Advancement of Health; 2000.
19. US Dept of Health and Human Services. *Put Prevention into Practice: Clinician's Handbook of Preventive Services*. 2nd ed. Washington, DC: Department of Health and Human Services; 1998.
20. Altman DG, Flora JA, Fortmann SP, et al. The cost-effectiveness of three smoking cessation programs. *American Journal of Public Health*. 1987;77:162–165.
21. Cummings SR, Rubin SM, Oster GO. The cost-effectiveness of counseling smokers to quit. *Journal of the American Medical Association*. 1989;261:75–79.
22. Fiscella K, Franks P. Cost-effectiveness of the transdermal nicotine patch as an adjunct to physicians' smoking cessation. *Journal of the American Medical Association*. 1996;275:1247–1251.
23. Green LW, Rimer B, Bertera R. How cost-effective are smoking cessation methods? *World Smoking & Health*. 1978;3:33–40.
24. Kemper DW. Self-care education: impact on HMO costs. *Medical Care*. 1982;20:710–718.
25. Leigh JP, Richardson N, Beck R, et al. Randomized controlled study of a retiree health promotion program. *Archives of Internal Medicine*. 1992;152:1201–1206.
26. Marks JS, Koplan JP, Hogue CJR, et al. A cost-benefit/cost-effectiveness analysis of smoking cessation for pregnant women. *American Journal of Public Health*. 1990;6:282–289.
27. Olds DL, Henderson CR, Phelps C, et al. Effect of prenatal and infancy nurse home visitation on government spending. *Medical Care*. 1993;31:155–174.
28. Pelletier KR. A review and analysis of the health and cost-effective outcome studies of comprehensive health promotion and disease prevention programs at the worksite: 1993–1995 update. *American Journal of Health Promotion*. 1996;10:380–388.
29. Smith GE, Rost K, Kashner TM. A trial of the effect of a standardized psychiatric consultation on health outcomes and costs in somatizing patients. *Archives of General Psychiatry*. 1995;52:238–243.
30. Vickery DM, Golaszewski TJ, Wright EC, et al. The effect of self-care interventions on the use of medical service within a Medicare population. *Medical Care*. 1988;26:580–588.
31. Vickery DM, Kalmer J, Lowry D, et al. Effects of a self-care education program. *Journal of the American Medical Association*. 1983;250:2952–2956.
32. Windsor RA, Lowe JB, Perkins LL, et al. Health education for pregnant smokers: its behavioral impact and cost benefit. *American Journal of Public Health*. 1993;83:201–206.
33. Bien TH, Miller WR, Tonigan JS. Brief interventions for alcohol problems: a review. *Addiction*. 1993;88:315–335.
34. Bottomly A. Where are we now? Evaluating two decades of group interventions with adult cancer patients. *Journal of Psychiatric and Mental Health Nursing*. 1997;4:251–265.
35. Devine EC, Cook TD. A meta-analytic analysis of effects of psychoeducational interventions on length of postsurgical hospital stay. *Nursing Research*. 1983;32:267–274.
36. Devine EC, O'Connor FW, Cook TD, et al. Clinical and financial effects of psychoeducational care provided by staff nurses to adult surgical patients in the post-drug environment. *American Journal of Public Health*. 1988;78:1293–1297.
37. Devine EC, Reifschneider E. A meta-analysis of the effects of psychoeducational care in adults with hypertension. *Nursing Research*. 1995;44:237–245.
38. Egbert LD, Battit GE, Welch CE, et al. Reduction of postoperative pain by encouragement and instruction of patients. *New England Journal of Medicine*. 1964;16:825–827.
39. Fleming MR, Barry KL, Manwell LB, et al. Brief physician advice for problem alcohol drinkers. *Journal of the American Medical Association*. 1997;277:1039–1045.
40. Fries JF, Fries ST, Parcell CL, et al. Health risk changes with a low-cost individualized health promotion program: effects at up to 30 months. *American Journal of Health Promotion*. 1992;6:364–371.
41. Goldberg ID, Allen G, Kessler L, et al. Utilization of medical services after short-term psychiatric therapy. *Medical Care*. 1981;19:672–686.
42. Heather N, Campion PD, Neville RG, et al. Evaluation of a controlled drinking minimal intervention for problem drinkers in general practice (the Drams Scheme). *Journal of the Royal College of General Practitioners*. 1987;37:358–363.
43. Kemper DW, Lorig K, Mettler M. The effectiveness of medical self-care interventions: a focus on self-initiated responses to symptoms. *Patient Education and Counseling*. 1993;21:29–39.
44. Maccoby N, Farquhar JW, Wood PD, et al. Reducing the risk of cardiovascular disease: effects of a community-based campaign on knowledge and behavior. *Journal of Community Health*. 1977;3:100–114.
45. Morisky DE, Levine DM, Green L, et al. Five-year blood pressure control and mortality following health education for hypertensive patients. *American Journal of Public Health*. 1983;73:153–162.
46. Mullen PD, Zapka JG. Health education and promotion in HMOs: the recent evidence. *Health Education Quarterly*. 1981;8:292–315.

47. Mumford E, Schlesinger HJ, Glass GV. The effects of psychological intervention on recovery from surgery and heart attacks: an analysis of the literature. *American Journal of Public Health*. 1982;72:141–151.
48. Rippe JM, Price JM, Hess SA, et al. Improved psychological well-being, quality of life, and health practices in moderately overweight women participating in a 12-week structured weight loss program. *Obesity Research*. 1998;6:208–218.
49. Rosen JC, Wiens AN. Changes in medical problems and use of medical services following psychological intervention. *American Psychologist*. 1979;34:420–431.
50. Roter DL, Hall JA, Merisca R, et al. Effectiveness of interventions to improve patient compliance. *Medical Care*. 1998;36:1138–1161.
51. Schneider RH, Staggers F, Alexander C, et al. A randomized controlled trial of stress reduction for hypertension in older African Americans. *Hypertension*. 1995;26:820–827.
52. Shipley RH, Orleans CT, Wilbur CS, et al. Effect of the Johnson & Johnson LIVE FOR LIFE program on employee smoking. *Preventive Medicine*. 1988;17:25–34.
53. World Health Organization Brief Intervention Group. A cross-national trial of brief interventions with heavy drinkers. *American Journal of Public Health*. 1996;86:948–955.
54. Beardslee WR, Salt P, Versage EM, et al. Sustained change in parents receiving preventive interventions for families with depression. *American Journal of Psychiatry*. 1997;154:510–515.
55. Beardslee WR, Wright E, Rothberg PC, et al. Response of families to two preventive intervention strategies: long-term differences in behavior and attitude change. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1996;35:774–782.
56. Beardslee WR, Wright EJ, Salt P, et al. Examination of children's responses to two preventive intervention strategies over time. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1997;36:196–204.
57. Clarke GN, Hawkins W, Murphy M, et al. Targeted prevention of unipolar depressive disorder in an at-risk sample of high school adolescents: a randomized trial of a group cognitive intervention. *Journal of the American Academy of Child and Adolescent Medicine*. 1995;34:312–321.
58. Durlak JA. Common risk and protective factors in successful prevention programs. *American Journal of Orthopsychiatry*. 1998;68:512–520.
59. Durlak JA, Wells AM. Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *American Journal of Community Psychology*. 1998;26:775–802.
60. Durlak JA, Wells AM. Primary prevention mental health programs for children and adolescents: a meta-analytic review. *American Journal of Community Psychology*. 1997;25:115–151.
61. Eakin E, Severson H, Glasgow RE. Development and evaluation of a smokeless tobacco cessation program. *National Cancer Institute Monographs*. 1989;8:95–100.
62. Field T, Grizzle N, Scafidi F, et al. Massage and relaxation therapies' effects on depressed adolescent mothers. *Adolescence*. 1996;31:903–911.
63. Field T, Widmayer S, Greenberg R, et al. Effects of parent training on teenage mothers and their infants. *Pediatrics*. 1982;69:703–707.
64. Finney JW, Riley AW, Cataldo MF. Psychology in primary health care: effects of brief targeted therapy on children's medical care utilization. *Journal of Pediatric Psychology*. 1991;16:447–461.
65. Tobler NS. Drug prevention programs can work: research findings. *Journal of Addictive Diseases*. 1992;11:1–28.
66. Ramey CT, Ramey SL. Effective early intervention. *Mental Retardation*. 1992;30:337–345.
67. Aktan GF, Kumpfer KL, Turner CW. Effectiveness of a family skills training program for substance use prevention with inner-city African-American families. *Substance Use & Misuse*. 1996;31:157–175.
68. Field TM, Scafidi F, Pickens J, et al. Polydrug-using adolescent mothers and their infants receiving early intervention. *Adolescence*. 1998;33:118–143.
69. Olds DL, Eckenrode J, Henderson CR, et al. Long-term effects of home visitation on maternal life course and child abuse and neglect. *Journal of the American Medical Association*. 1997;278:637–643.
70. Fleming MF, Manwell LB, Barry KL, et al. Brief physician advice for alcohol problems in older adults: a randomized community-based trial. *Journal of Family Practice*. 1999;48:378–384.
71. German PS, Burton LC, Shapiro S, et al. Extended coverage for preventive services for the elderly: response and results in a demonstration population. *American Journal of Public Health*. 1995;85:379–386.
72. Field T. Infants of depressed mothers. *Infant Behavior and Development*. 1995;18:1–13.
73. Field T, Grizzle N, Scafidi F, et al. Massage therapy for infants of depressed mothers. *Infant Behavior and Development*. 1996;19:107–112.
74. *Guide to Clinical Preventive Services: Report of the US Preventive Services Task Force.* Baltimore, MD: Williams & Wilkins; 1989.